

PlasticsEurope

Avenue E. Van Nieuwenhuysse 4/3
BE 1160 Brussels · Belgium

Phone +32 (0)2 675 32 97

Fax +32 (0)2 675 39 35

info@plasticseurope.org

www.plasticseurope.org

10/2007 Design: Lilling Marketing Communication



**Construction and Housing –
perfect climate protection for
houses and apartments**

PlasticsEurope
Association of Plastics Manufacturers

 **Plastics**
The Material for the 21st Century

Building with plastic materials is active protection of the environment

Plastics used in houses and apartments are not always conspicuous. Nonetheless, they are indispensable when it comes to protecting the environment and saving resources. They are used for insulation, pipe and ventilation systems, window frames and the interior. Wherever they are applied, they save important resources, as their production is cost-efficient and they can be integrated quickly and easily. Moreover, they are maintenance-friendly and have a long service life. A study conducted by the “Fraunhofer Institute for Systems and Innovation Research (ISI) with headquarters in Karlsruhe, and the Corporation for Comprehensive Analyses (GUA) of Vienna/Austria found that the amount of energy required for the production of plastic insulation material used to cover a standard house is recovered after one year of use.

Innovative passive houses in Rothenburg, a suburb of Luzern in Switzerland: Environmentally-friendly accommodation with a high standard of living thanks to state-of-the-art plastics. There is a vast potential for saving energy in apartments and houses in Europe.



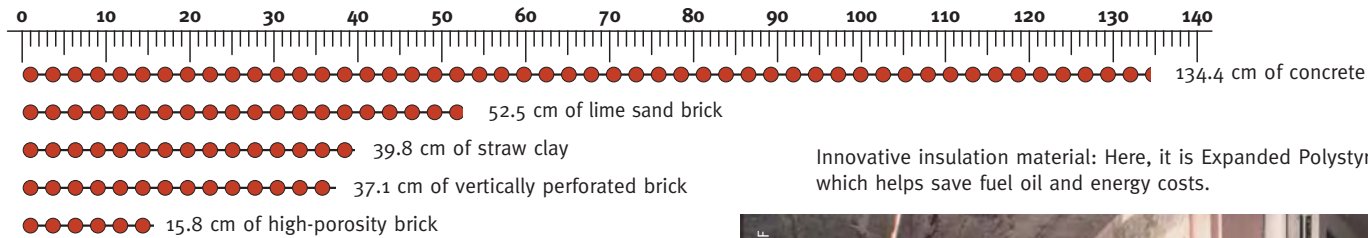
Fig. Source: BASF

Plastics can help save energy – hard facts

Saving energy and money as well as reducing CO₂ emissions – no problem with solutions made from plastics. The potential for saving energy and money is vast. Here are just a few examples:

- It takes only seventy litres of crude oil to manufacture a cubic meter of rigid PU foam for roof insulation. Over a period of fifty years, the integration of a single cubic meter of rigid foam saves about 5,500 litres of heating oil. Thanks to this form of insulation, the amount of CO₂ released into the atmosphere is reduced by 19,000 kg and the amount of other emissions that affect the climate is also reduced.
- The energy balance sheet for plastic window frames is also impressive: were they used all over Europe, they would help save forty million kilowatt hours of electricity, which is the equivalent of the nominal output of five large power stations.
- Regardless of whether a building is situated in Warsaw, Frankfurt/Main, London, Paris, Rome or Seville, improving the thermal insulation of houses all over Europe by upgrading them from the standards applied to old buildings to those applied to low energy houses would reduce the amount of energy used and the amount of CO₂ emitted by between 70 % and 75 % per year. This is the result of research into the effect of thermal insulation materials on the energy efficiency balance of buildings.

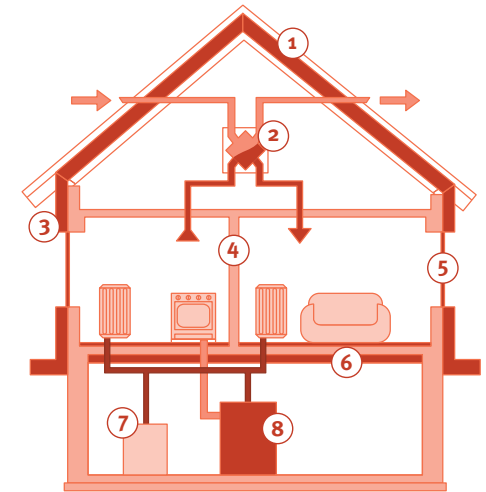




Thermal insulation effect of different construction materials

Source: EAM

Innovative insulation material: Here, it is Expanded Polystyrene (EPS) which helps save fuel oil and energy costs.



Energy-efficient and environmentally-friendly accommodation: Efficient thermal insulation with polymer materials reduces the energy consumption of buildings new and old.

Less material – better insulation

The thermal insulation potential of different construction materials varies substantially. The thermal insulation effect of rigid PU foam slabs with a thickness of 1.6 cm is on a par with that of a concrete wall with a thickness of 1.3 m. An impressive performance!

Thermal management of modern accommodation also includes protection from heat during the summer months. Thanks to modern polymer materials the inner plaster can be equipped with a latent heat accumulator with the effect that the room stays cool for longer. This is another example of the outstanding thermal insulation potential of polymer materials: a plaster layer with a thickness of only 2 cm and 30 % latent heat accumulation provides the equivalent heat accumulation capacity of a brick wall with a thickness of 30 cm!

Plastics from cellar to roof

Modern plastics are not only important for thermal insulation measures:

- Plastic heating, water and sewage pipes offer apparent advantages: the production of plastic pipes is cost-efficient and uses little energy; plastic pipes are flexible, non-corrosive and guarantee high-quality drinking water.
- Metal water pipes damaged by lime scale can be repaired by means of a special plastic-resin coating to protect the pipes from future lime scale damage.



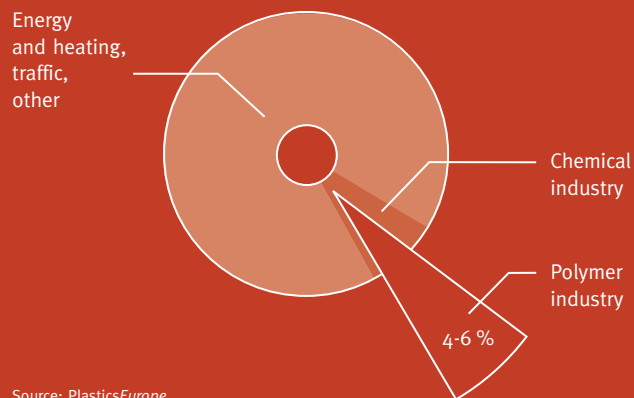
- 1 Roof insulated with polymer materials
- 2 Ventilation system / heat recovery (plastic pipes)
- 3 Exterior façade insulated with polymer materials
- 4 Interior walls insulated with polymer materials
- 5 Triple-glazed plastic windows
- 6 Cellar insulated with plastic materials
- 7 Heating system/heating pipes made from plastics
- 8 Fuel cell

Source: BASF

Plastics save energy. Plastics protect the climate!

- Plastics production consumes only a small amount of raw material. As they use up only between 4 % and 6 % of the total amount of crude oil and natural gas consumed, plastics have a relatively low demand.
- Plastic products have a long service life, high wear resistance and the energy consumed for their development is fairly low.
- The production of plastics is straightforward and cost-efficient.
- Plastics are lightweight: compared with many other materials such as glass, metal or ceramics, they save a significant amount of weight.
- Plastics are stored energy. The energy used for heating, for example, is irretrievably lost: the energy stored in the plastic product can be re-used for generating heat power in combined heat and power stations as well as for many other industrial processes.
- In many applications, plastics contribute to saving energy.

Crude oil and natural gas consumption in Western Europe



Source: PlasticsEurope

Use little energy for the production of plastics. Save a lot of energy by using them!

Almost 90 % of Europe's crude oil is consumed for the production of petrol, diesel or for fuel oil used for heating buildings. This generates a substantial amount of carbon dioxide emissions and places a burden on the environment that should not be underestimated. Therefore, cutting the energy that is used for heating buildings is an important contribution.

The realisation that the conveniences of modern life and an environmentally-friendly lifestyle can go hand in hand is not new. Plastics are real energy savers – not only in new buildings. Successful building of the future is cost and energy-efficient thanks to

- improved thermal insulation using less material. The lower the heat loss or the more pronounced the insulation effect, the more substantial the energy saving.
- solutions with a long service life. Heating, water or sewage pipes that last longer consume less energy for production.

With their outstanding insulation, non-corrosive and weather-resistant properties and long service life plastics save a substantial amount of oil in every apartment and every house. Only about 4 % to 6 % of Europe's total consumption of crude oil and natural gas is used for the production of plastics. The plastic applications thus produced help save energy and reduce the amount consumed for construction and domestic living – and the energy saved is more than the energy used for their production.

Use a little energy for the production of plastics.
Save a lot of energy by using them!



Plastics – think differently about energy

Saving energy, protecting resources, securing the future

The leaflet *Construction and Housing – perfect climate protection for houses and apartments* is part of a series of information brochures and leaflets on energy published by PlasticsEurope.

Also available:

Brochure

Plastics – think differently about energy

Leaflet

Mobility – how to make travelling easier on the environment

At Home – making people's lives easier. And Nature's, too.

Packaging – the best protection with less and less material

Renewable Energy – the power of the elements